

I. Tantárgyleírás

1. Alapadatok

1.1 Tantárgy neve

GEOLOGY

1.2 Azonosító (tantárgykód)

BMEEOGMBSFC001-00

1.3 Tantárgy jellege

Kontaktórás tanegység

1.4 Óraszámok

Típus	Óraszám / (nap)
Előadás (elmélet)	1
Laboratóriumi gyakorlat	2

1.5 Tanulmányi teljesítményértékelés (minőségi értékelés) típusa

Vizsga

1.6 Kreditszám

3

1.7 Tárgyfelelős

név	Dr. Török Ákos
beosztás	Egyetemi tanár
email	torok.akos@emk.bme.hu

1.8 Tantárgyat gondozó oktatási szervezeti egység

Geotechnika és Mérnökgeológia Tanszék

1.9 A tantárgy weblapja

epito.bme.hu

<https://edu.epito.bme.hu/course/view.php?id=5185>

1.10 Az oktatás nyelve

magyar

1.11 Tantárgy típusa

Kötelező az építőmérnöki (BSc) szakon

1.12 Előkövetelmények

1.13 Tantárgyleírás érvényessége

2025. szeptember 1.

2. Célkritériumok és tanulási eredmények

2.1 Célkritériumok

The aim of the course is to equip students with the geological knowledge required for civil engineering design, construction, and research, with particular consideration of sustainability aspects. The course presents the geological factors that influence the selection of construction sites, the design of engineering structures, and their long-term preservation. In addition to introducing the process of geological data acquisition, the course covers the structure and dynamics of the Earth, and the characteristics of the Earth's crust materials—namely minerals and rocks, including igneous, sedimentary, and metamorphic rocks. Special emphasis is placed on the analysis of surface processes, such as earthquakes and volcanism, as well as the characterization of surface movements and surface and groundwater systems. The course also introduces the fundamentals of environmental geology and examines the interactions between the geological environment and engineering structures. Educational Purpose: To expand the natural science knowledge of engineering students and to build connections between natural sciences and engineering disciplines.

2.2 Tanulási eredmények

A tantárgy sikeres teljesítése után a hallgató

A. Tudás

1. Knows the role of geology in engineering practice. 2. Knows the structure of the Earth and the geological time scale. 3. Knows the definitions and concepts of minerals and rocks. 4. Knows the characteristics and accessibility of raw materials required for civil engineering activities. 5. Knows the main types of igneous rocks and their occurrences in Hungary. 6. Knows the main types of sedimentary and metamorphic rocks and their occurrences in Hungary. 7. Knows the basic concepts of structural geology. 8. Knows the characteristics of geological maps and cross-sections. 9. Knows the surface-shaping (geomorphological) processes. 10. Knows the systems of surface and subsurface waters. 11. Is familiar with the fundamental field and laboratory geological investigation methods.

B. Képesség

1. Capable of identifying and recognizing rocks, and describing them both in the field and in the laboratory. 2. Capable of interpreting geological maps and preparing geological cross-sections. 3. Capable of determining the key geological characteristics of a given area. 4. Capable of recognizing geological processes and interpreting them from an engineering perspective. 5. Able to carry out local rock diagnostic tasks and prepare a professional geological report. 6. Capable of expressing thoughts in a structured manner, both orally and in writing.

C. Attitűd

1. Collaborates with the instructor and fellow students in the process of expanding knowledge. 2. Continuously expands their knowledge through ongoing learning. 3. Open to the use of information technology tools. 4. Strives for accurate and error-free task execution. 5. Strives to establish coherence between geology and engineering sciences, and to integrate this approach into problem-solving.

D. Önállóság és felelősség

1. Capable of independently identifying the type of rock, considering the problems associated with its properties, and further analyzing it based on relevant sources. 2. Takes into account the limitations of understanding geological processes and recognizes the engineering responsibility in predicting geological phenomena. 3. Receives well-founded critical feedback with openness. 4. Applies a systems-based approach in their thinking.

2.3 Oktatási módszertan

Lectures, mineral and rock identification exercises, map and cross-section construction exercises, presentation of diagnostic tasks, and communication in written and oral form.

2.4 Részletes tárgyprogram

Topics of Lectures and Practical Sessions: 1. The importance of geology in engineering practice: securing construction materials, the built environment, and geological hazards. Methods of acquiring geological knowledge; the internal structure and dynamics of the Earth. The building materials of the Earth's crust: minerals and rocks. The rock formation cycle. 2. Engineering applications and relevance of geology; areas of application; introduction to minerals and the textural characteristics of rocks. 3. Classification and characterization of igneous rocks; their use in construction. 4. Presentation and identification of igneous rocks. 5. Characteristics and engineering geological significance of clastic sedimentary rocks. 6. Presentation and identification of clastic

and chemical sedimentary rocks. 7. Characteristics and engineering geological role of chemical sedimentary rocks; properties of metamorphic rocks. 8. Presentation and identification of metamorphic rocks. 9. Major geological phenomena – the effects of internal forces, rock formations, mountain building, volcanism, and earthquakes. 10. Engineering geological field trip (geological structure of Gellért Hill). 11. Effects of external forces: mass movements, erosion, deflation, accumulation, and anthropogenic impacts. 12. Comparative analysis of all rock types; practice in rock identification. 13. Geology of water: characteristics of the hydrosphere; formation and development of surface and subsurface water systems; origin, system, temperature, and chemical composition of groundwater. Characterization of groundwater types: phreatic, confined, karst, and fissure waters; assessment of water resources. 14. Geological map and cross-section construction.

A félév közbeni munkaszüneti napok miatt a program csak tájékoztató jellegű, a pontos időpontokat a tárgy honlapján elérhető "Részletes féléves ütemterv" tartalmazza.

2.5 Tanulástámogató anyagok

a) Textbooks Kehew, A. (2022). Geology for Engineers and Environmental Scientists. Waveland Press, Inc. Bell, F.G. (2016). Fundamentals of Engineering Geology. Elsevier. b) Downloadable Materials Geology practice notes Guide for the Homework Assignment

2.6 Egyéb tudnivalók

1. During the semester, a field excursion will be held to introduce the role of geological knowledge in engineering practice. 2. As part of the practical sessions, the acquired knowledge will, where possible, also be demonstrated in the field. 3. The presentation of the minerals will take place at the ELTE Mineral Collection during a previously announced practical session. We will walk there (approximately 15 minutes), and the start and end times will be scheduled accordingly.. 4. To complete the rock diagnostics homework assignment, each student is required to examine a stone-structured building element on site.

2.7 Konzultációs lehetőségek

Consultation appointments: as specified on the website of the department issuing the thesis topic, or by prior arrangement via email with the lecturers.

Jelen TAD az alábbi félévre érvényes:

II. Tárgykövetelmények

3. A tanulmányi teljesítmény ellenőrzése és értékelése

3.1 Általános szabályok

The learning outcomes defined in Section 2.2 are assessed based on two rock identification tests, one geological mapping midterm test, one home assignment, and a written exam. In addition to obtaining the course signature, passing the exam is a prerequisite for the successful completion of the course. Detailed information about the exam procedure and requirements (minimum questions, topics, etc.) is provided on the course website. If students with signature from previous semester retake the whole semester instead of taking the exam course, the better midterm result will be taken into account. Midterm results previously obtained are accepted for up to six semesters.

3.2 Teljesítményértékelési módszerek

Assessment Name (Type)	Code	Assessed Learning Outcomes
1. control test	CT1	A.3-A.5; B.1; C1-C2; C4-C5; D1
2. control test	CT2	A.3; A.4; A.6; B.1; C1-C2; C4-C5; D1
Midterm test	MT	A.7, A.8; B.2; C1-C2; C4-C5; D.2
Homework	HW	A.3-A.6; B.5-B.6; C.1-C5; D.1-D.4,
Written exam	E	A.1-A.11; B.1-B.6; C.1-C5.; D1-D4

A szorgalmi időszakban tartott értékelések pontos idejét, a házi feladatok ki- és beadási határidejét a "Részletes féléves ütemterv" tartalmazza, mely elérhető a tárgy honlapján.

3.3 Teljesítményértékelések részaránya a minősítésben

Code	Weight
CT1	10%
CT2	10%
MT	15%
HW	15%
E	50%
Total	100%

3.4 Az aláírás megszerzésének feltétele, az aláírás érvényessége

3.5 Érdemjegy megállapítása

3.6 Javítás és pótlás

1. The homework assignment may be submitted late—subject to the payment of the fee specified in the regulations—until 16:00 on the last day of the retake period, or sent electronically by 23:59. 2. A submitted and accepted homework assignment may be revised free of charge until the deadline and in the manner specified in point 1). 3. The control tests and midterm test may each be retaken or improved once during the retake period. In the case of improvement, the more favorable result for the student (between the original and the retake) will be taken into account.

3.7 A tantárgy elvégzéséhez szükséges tanulmányi munka

Activity	Hours/Semester
Participation in contact hours	14×3=42
Preparation for practical sessions during the semester	14×1=14
Preparation for performance assessments	3×4=12
Completion of the homework assignment	6
Preparation for the examination	16

3.8 A tárgykövetelmények érvényessége

2025. szeptember 1.

Jelen TAD az alábbi félévre érvényes:
